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BUREAU OF MINES MINERALS YEARBOOK

The Mineral Industry of Kansas

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UNITED STATES DEPARTMENT OF THE INTERIOR • Donald Paul Hodel, Secretary

BUREAU OF MINES • Robert C. Horton, Director

This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Kansas

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Kansas Geological Survey for collecting information on all nonfuel minerals.

By James J. Hill,[1] David A. Grisafe,[2] and Wanda J. West[3]

The value of nonfuel mineral production in Kansas was $312 million in 1984, nearly 17% greater than that of 1983 and the highest value reported in 6 years. The State ranked 24th nationally in nonfuel mineral production value after ranking 25th in 1983. Output increased for all minerals produced in the State except for masonry cement, rock salt, sand and gravel, and dimension stone.

Kansas led the Nation in the production of helium. Cement sales continued to account for the greatest portion of the State's mineral commodity value, followed by, in order of importance, salt, crushed stone, Grade-A helium, and construction sand and gravel.

Table 1.—Nonfuel mineral production in Kansas[1]

Mineral		1983		1984	
		Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand short tons	718	$3,921	918	$5,537
Gem stones		NA	1	NA	1
Helium:					
Crude	million cubic feet	188	3,572	402	8,844
Grade-A	do.	775	27,125	1,015	38,063
Salt[2]	thousand short tons	1,719	67,195	1,712	71,558
Sand and gravel:					
Construction	do.	e12,400	e26,600	11,796	26,358
Industrial	do.	199	2,184	W	W
Stone (crushed)	do.	r12,687	r45,121	e13,600	e48,500
Combined value of cement, gypsum, lime, pumice, salt (brine), stone (dimension), and value indicated by symbol W		XX	91,866	XX	113,149
Total		XX	r267,585	XX	312,010

eEstimated. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes salt in brines; value included with "Combined value" figure.

Table 2.—Value of nonfuel mineral production in Kansas, by county[1]

(Thousands)

County	1982	1983	Minerals produced in 1983 in order of value
Allen	W	W	Cement, stone (crushed), clays.
Anderson	(2)	$188	Stone (crushed).
Atchison	(2)	W	Do.
Barber	W	W	Gypsum.
Barton	W	89	Clays.
Bourbon	(2)	W	Stone (crushed).
Butler	(2)	1,214	Do.
Chase	(2)	77	Stone (dimension).
Chautauqua	(2)	250	Stone (crushed).
Cherokee	W	185	Clays, stone (crushed).
Cheyenne	$25	(3)	
Clark	22	(3)	
Clay	W	W	Stone (crushed).
Cloud	W	W	Clays.
Coffey	(2)	381	Stone (crushed).
Cowley	329	990	Stone (crushed), stone (dimension).
Crawford	W	748	Stone (crushed), clays.
Decatur	83	(3)	
Dickinson	W	1,041	Stone (crushed).
Doniphan	(2)	W	Do.
Douglas	W	W	Do.
Edwards	87	(3)	
Elk	(2)	W	Stone (crushed).
Ellis	216	W	Do.
Ellsworth	8,997	W	Helium, salt, clays.
Finney	W	(3)	
Ford	W	(3)	
Franklin	W	W	Stone (crushed), clays.
Geary	W	(3)	
Gove	50	(3)	
Graham	35	59	Stone (crushed).
Grant	W	W	Helium.
Gray	33	(3)	
Greeley	14	(3)	
Greenwood	153	W	Stone (crushed).
Hamilton	165	(3)	
Harper	W	(3)	
Harvey	W	(3)	
Haskell	W	(3)	
Hodgeman	28	(3)	
Jackson	21	(3)	
Jefferson	(2)	2,525	Stone (crushed).
Jewell	W	W	Stone (crushed), clays.
Johnson	W	6,719	Stone (crushed).
Kearny	346	(3)	
Kingman	36	(3)	
Kiowa	274	(3)	
Labette	(2)	944	Stone (crushed).
Leavenworth	(2)	W	Do.
Lincoln	73	W	Do.
Linn	(2)	W	Do.
Logan	13	(3)	
Lyon	49	W	Stone (crushed).
McPherson	W	W	Clays.
Marion	(2)	W	Stone (crushed).
Marshall	W	W	Gypsum, stone (crushed).
Meade	40	(3)	
Miami	(2)	W	Stone (crushed).
Montgomery	W	W	Cement, stone (crushed), clays.
Morris	(2)	W	Stone (crushed).
Morton	W	W	Helium.
Nemaha	(2)	252	Stone (crushed).
Neosho	W	W	Cement, stone (crushed), clays.
Ness	94	(3)	
Norton	W	W	Pumice, stone (crushed).
Osage	(2)	W	Stone (crushed).
Ottawa	112	(3)	
Pawnee	142	(3)	
Phillips	35	(3)	
Pottawatomie	104	W	Stone (crushed), stone (dimension).
Pratt	W	(3)	
Rawlins	20	(3)	
Reno	52,788	48,967	Salt.
Republic	W	W	Sand (industrial).
Rice	W	W	Salt, stone (crushed).
Riley	W	W	Stone (crushed), stone (dimension).
Rooks	19	(3)	
Rush	W	W	Helium.
Russell	47	(3)	
Saline	W	(3)	

See footnotes at end of table.

Table 2.—Value of nonfuel mineral production in Kansas, by county[1] —Continued

(Thousands)

County	1982	1983	Minerals produced in 1983 in order of value
Sedgwick	W	W	Salt.
Seward	$314	(2)	
Shawnee	798	W	Stone (crushed).
Sheridan	51	(2)	
Sherman	W	W	Lime.
Smith	(2)	W	Stone (crushed).
Stafford	W	(2)	
Stevens	46	(2)	
Sumner	W	(2)	
Thomas	144	(2)	
Trego	105	$12	Stone (crushed).
Wabaunsee	(2)	--	
Wallace	4	(2)	
Washington	W	(2)	
Wichita	20	(2)	
Wilson	W	W	Cement, stone (crushed), clays.
Woodson	W	W	Clays.
Wyandotte	W	W	Cement, stone (crushed), sand (industrial).
Undistributed[4]	r149,892	176,345	
Sand and gravel (construction)	XX	e26,600	
Stone:			
Crushed	e41,100	XX	
Dimension	W	XX	
Total	r256,924	3267,585	

eEstimated. rRevised. W Withheld to avoid disclosing company proprietary data; included with "Undistributed." XX Not applicable.

[1]Brown, Comanche, Lane, Mitchell, Osborne, Scott, and Stanton Counties are not listed because no nonfuel mineral production was reported.

[2]Stone, either crushed or dimension, was produced; data not available by county. Total State values are shown separately under "Stone."

[3]Construction sand and gravel was produced; data not available by county. Total State value is shown separately under "Sand and gravel (construction)."

[4]Includes gem stones that cannot be assigned to specific counties and values indicated by symbol W.

[5]Data do not add to total shown because of independent rounding.

Table 3.—Indicators of Kansas business activity

		1982r	1983	1984p
Employment and labor force, annual average:				
Population	thousands	2,408	2,426	2,438
Total civilian labor force	do.	1,186	1,186	1,197
Unemployment	do.	74	72	63
Employment (nonagricultural):				
Mining total[1]	do.	18.8	17.2	17.8
Nonmetallic minerals except fuels[1]	do.	1.2	1.2	1.2
Coal mining[1]	do.	.5	.4	.4
Oil and gas extraction[1]	do.	17.2	15.6	16.2
Manufacturing total	do.	168.8	164.7	176.5
Primary metal industries	do.	2.9	2.4	3.2
Stone, clay, and glass products	do.	6.6	6.8	7.1
Chemicals and allied products	do.	8.5	8.0	8.2
Petroleum and coal products	do.	4.5	3.7	3.3
Construction	do.	39.0	39.7	42.2
Transportation and public utilities	do.	61.4	62.2	64.1
Wholesale and retail trade	do.	227.9	229.0	238.3
Finance, insurance, real estate	do.	48.9	50.0	51.5
Services	do.	172.8	175.9	183.7
Government and government enterprises	do.	183.8	182.9	186.4
Total	do.	921.4	921.6	960.5
Personal income:				
Total	millions	$28,246	$29,146	$32,300
Per capita		$11,731	$12,015	$13,248
Hours and earnings:				
Total average weekly hours, production workers		39.2	39.1	40.2
Mining		41.9	43.1	44.6
Total average hourly earnings, production workers		$8.80	$9.23	$9.40
Mining		$9.20	$9.03	$9.38

See footnotes at end of table.

Table 3.—Indicators of Kansas business activity —Continued

		1982[r]	1983	1984[p]
Earnings by industry:	millions	$1,211	$825	$1,300
Farm income	do.	$17,900	$18,902	$20,693
Nonfarm	do.	$711	$543	$601
Mining total	do.	$21	$24	$24
Nonmetallic minerals except fuels	do.	$16	$14	$15
Coal mining	do.	$674	$505	$563
Oil and gas extraction	do.	$3,969	$4,070	$4,605
Manufacturing total	do.	$70	$64	$88
Primary metal industries	do.	$164	$180	$191
Stone, clay, and glass products	do.	$234	$219	$232
Chemicals and allied products	do.	$176	$148	$129
Petroleum and coal products	do.	$984	$1,085	$1,218
Construction	do.	$1,719	$1,863	$1,953
Transportation and public utilities	do.	$3,184	$3,343	$3,638
Wholesale and retail trade	do.	$932	$1,058	$1,164
Finance, insurance, real estate	do.	$3,112	$3,453	$3,829
Services	do.	$3,224	$3,416	$3,606
Government and government enterprises	do.			
Construction activity:		8,628	14,214	16,164
Number of private and public residential units authorized	millions	$392.1	$667.1	$518.9
Value of nonresidential construction	do.	$73.7	$238.9	$277.5
Value of State road contract awards	thousand short tons	974	1,004	1,266
Shipments of portland and masonry cement to and within the State				
Nonfuel mineral production value:	millions	$256.9	$257.6	$312.0
Total crude mineral value		$106	$110	$128
Value per capita				

[p]Preliminary. [r]Revised.
[1]Kansas Department of Human Resources, Division of Employment.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

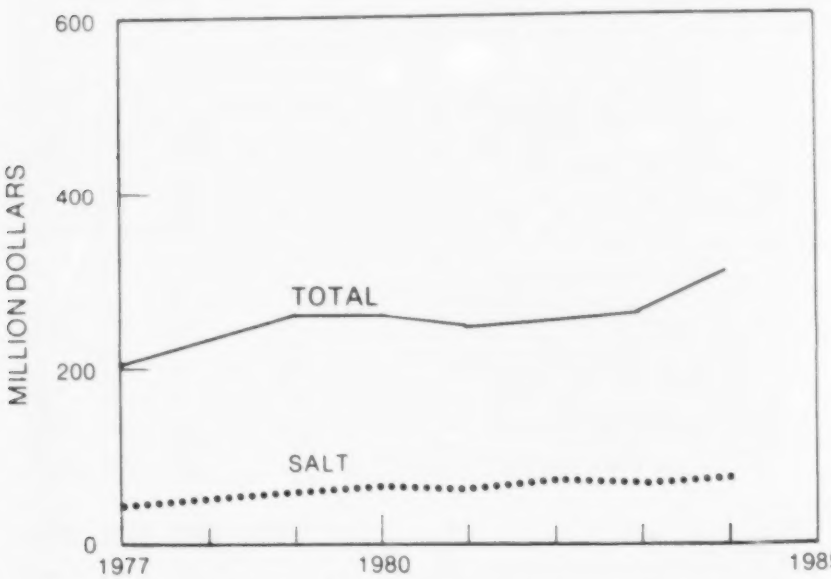

Figure 1.—Value of salt and total value of nonfuel mineral production in Kansas.

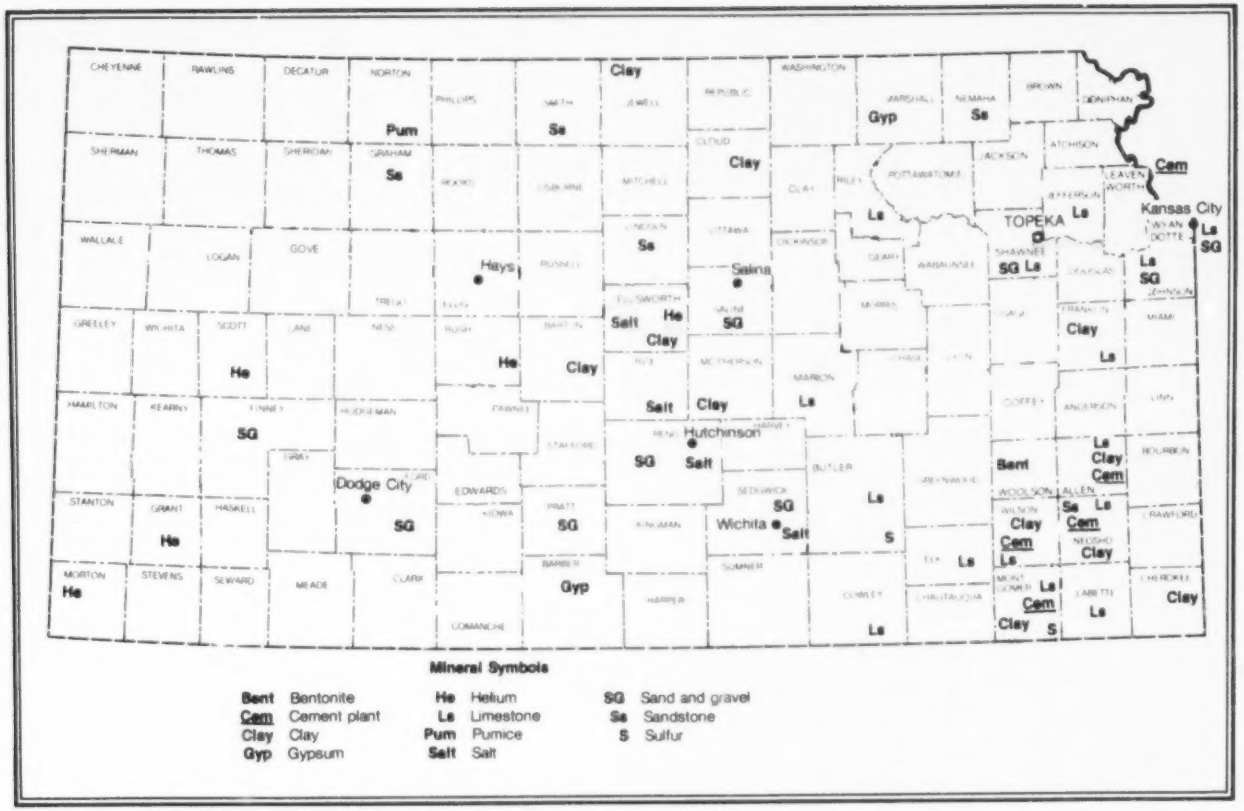

Figure 2.—Principal mineral producing localities in Kansas.

Trends and Developments.—Increased construction activity gave impetus to sales of several mineral commodities produced in the State. The State approved expenditure of $277.5 million in road funds in 1984 as part of a 5-year, $1 billion highway improvement program authorized in 1983; this compared with $238.3 million in contracts awarded in 1983. The Federal Department of Transportation authorized $190 million for work in Kansas in 1984, compared with $157 million in 1983. The increase in Federal funding can be attributed to the Surface Transportation Assistance Act of 1982 that distributes revenue to the States from the 4-cent-per-gallon Federal fuels tax increase that went into effect in April 1983.

The U.S. Department of Commerce reported a 13.7% increase in the number of permits issued for the construction of public and private residential units. Nonresidential construction was valued at $518.9 million during 1984.

Employment.—The Kansas Department of Human Resources, Division of Employment, reported a monthly average of 1,289 persons employed in the mining and quarrying of nonmetallic minerals (excluding fuels) in 1984, the highest monthly average since 1981. The monthly average in 1983 was 1,259 persons. In 1984, employment peaked in October with 1,392 workers reported. The year's low was in January when 1,085 persons were employed. Historically, January, February, and March are the lowest months of employment because many crushed stone and sand and gravel operations suspend operations for the winter months or operate at reduced levels.

Legislation and Government Programs.—Two mining-related pieces of legislation were enacted during 1984. House Bill 2839 required that for every foot of depth excavated at a quarry or minesite, at least 1 foot of unexcavated land must remain between the excavation and the property line of the person who owns the land being excavated. An exception was made for adjoining lands when both properties are being excavated for mining or quarrying purposes. The bill also provided for a $1,000 civil penalty for violations, plus the award of actual damages.

Senate Bill 816 authorized the Mined Land Conservation and Reclamation Board to assess a fee of not less than $.03 and not more than $.10 per ton of coal extracted. This fee was in addition to the $50 basic fee based on acreage and would finance part of the operations of the Mined Land Division of the Kansas Corporation Commission.

The Kansas Geological Survey continued its research and service-related earth-science programs during 1984. Emphasis was on ground water, geophysics, subsurface geology, and geologic data automation.

In early 1984, the cooperative effort between the Kansas and Missouri Geological Surveys in conjunction with the U.S. Geological Survey Conterminous United States Mineral Appraisal Program (CUSMAP) proceeded from the planning stage to full operation. The program was designed to assess the mineral resource potential of the Joplin 1° by 2° Quadrangle. Phases of the investigation included modeling of known deposits, mapping the surface and subsurface geology, geochemical and geophysical studies, remote sensing, and development of a comprehensive data base. The project, expected to be completed in 1988, will result in a comprehensive analysis of the resource potential within the Joplin Quadrangle.

By yearend, 12 deep holes (to basement rock) were examined, which included the collecting and splitting of cuttings at 10-foot intervals, binocular microscope examination of the cuttings and their hydrochloric acid insoluble residues, and the emission spectrographic determination of 36 elements within these residues. In addition, an aeromagnetic survey of the quadrangle was completed using east-west traverses one-half mile apart, with north-south tie lines. Also, approximately one-half of the gravity measurements in the quadrangle were completed. Some remote-sensing data were obtained, including color infrared (false color photography), high-altitude black-and-white photography, and thematic mapper imagery (natural color).

In the spring of 1984, the University Press of Kansas issued the Kansas Geological Survey publication "Kansas Geology," an introduction to landscapes, rocks, minerals, and fossils of the State.

In the fall of 1984, the U.S. Environmental Protection Agency (EPA) began a feasibility study of the pollution problems in the Tar Creek area, a portion of the Tri-State lead-zinc mining district that extends into southeastern Kansas and covers portions of Missouri and Oklahoma. The investigation will examine the extent and magnitude of ground and surface water contamination resulting from the abandoned lead-zinc mines in the area. EPA has labeled the 40-square-mile area as one of the most dangerous hazardous waste sites in the Nation. Kansas and Oklahoma had requested money from EPA under the Environmental Response, Compensation, and Liability Act of 1980 (Superfund) to help resolve the pollution problems.

REVIEW BY NONFUEL MINERAL COMMODITIES

NONMETALS

Cement.—Nationally, Kansas ranked 11th in sales of portland cement and 17th in sales of masonry cement. Portland cement sales increased 15%, and masonry cement sales dropped about 3% during 1984. Average value per short ton increased about 6% for portland cement and 16% for masonry cement.

The 5 companies operating cement plants in the State had a total of 14 kilns and produced both portland and masonry cements. All of the plants produced Types I and II, general use and moderate heat portland cement. Other types produced by one or more plants included Type III, high-early-strength, an oil-well cement, and a waterproof portland cement. Shipments to consumers were mostly in bulk form by rail and truck.

Approximately 2.8 million tons of cement rock and limestone, 340,000 tons of clay and shale, and 87,000 tons of gypsum, along with lesser quantities of sand and sandstone were consumed in the cement manufacturing process.

About 1,243,000 tons of portland cement was consumed in the State, along with 23,000 tons of masonry cement.

In March, General Portland Inc. was granted a temporary permit by the EPA to test burn solvent wastes at its Fredonia cement plant for use as a supplemental fuel. The wastes were stringently tested to ensure that they contained no detrimental materials such as pesticides and herbicides. General Portland realized substantial savings in fuel costs while testing the solvent fuels and expected to receive a permanent permit for their use from EPA in 1985. Previously, the company used coal and coke as the primary fuel for the Fredonia plant with natural gas as a backup source. The firm estimated that as much as 50% of its fuel needs could be met with solvent wastes.

General Portland's Fredonia facility was also involved in a 6-week strike that was settled in November.

The Monarch Cement Co. installed a new roller mill at its Humboldt plant that became operational in March.

Clays.—Kansas ranked 16th nationally in clay and shale output. Production increased about 28%, and value increased 41% during 1984. Common clay was produced in 11 counties by 11 companies. The manufacture of portland cement accounted for 43% of the common clay usage. Lightweight aggregate for concrete blocks and other structural concrete products accounted for the second major use. Common clay was also used to manufacture common and face brick, ceramic floor and wall tile, drain tile, roof tile, and sewer tile.

Micro-Lite Inc. mined a micaceous bentonitic clay in Woodson County for use in manufacturing feed and fertilizer supplements.

Kansas Brick & Tile Co. Inc. at Hoisington, Barton County, began to modernize its facility by installing a new tunnel kiln and grinding equipment, costing approximately $4.5 million, that will be located adjacent to existing facilities. Completion of the project was expected in mid-1985. The company manufactures a variety of colored brick and uses blends of clays from three pits in the Cretaceous Dakota Formation.

In February, Acme Brick Co., a subsidiary of Justin Industries Inc., upgraded its facilities at Weir, Cherokee County, by replacing burners and installing a refractory fiber lining on a portion of its tunnel kiln. The improvements resulted in a 25% reduction in fuel consumption.

In April, Buildex Inc., a division of Clemens Coal Co., purchased the assets of the Lightweight Aggregate Div. of the Carter Waters Corp., Kansas City, MO. The acquisition of the plant at New Market, MO, coupled with the existing Buildex plants at Ottawa, Franklin County, and Marquette, McPherson County, was expected to increase the annual production capacity of Buildex to over 700,000 cubic yards of expanded shale lightweight aggregate per year and to expand the company's market area.

Cloud Ceramics, a division of General Finance Inc., upgraded its Concordia facility, Cloud County, by purchasing a $250,000 pug mill and extruder unit to replace a unit that, since 1957, had produced over 650 million brick. The company also installed a new crusher for producing grog from scrap brick. Cloud Ceramics planned to purchase a new cutter during 1985, further improving its plant. Bishop Brick Co. at Humboldt, Allen County, underwent a general rejuvenation during 1984, installing a new periodic kiln and rebuilding its shale planer used in mining. Bishop acquired the facility in 1983; it was formerly operated by Humboldt Brick & Tile Co.

Gypsum.—Kansas ranked eighth nationally in crude gypsum production. Output and value increased about 11% and 12%,

respectively, because of increased demand by the construction industry. Two companies mined gypsum—Georgia-Pacific Corp. at its Blue Rapids Mine in Marshall County and National Gypsum Co. at its Sun City Mine in Barber County. Both companies operated underground mines; National Gypsum also had a surface operation. National Gypsum's Sun City Mine ranked sixth nationally in production.

National Gypsum and Georgia-Pacific calcined gypsum at their operations. Production and value of the calcined product increased about 1% and 7%, respectively.

Helium.—Kansas continued to rank first in production of crude and Grade-A helium. Production and value of Grade-A helium increased about 31% and 40%, respectively. Crude helium production jumped from 188 to 402 million cubic feet in 1984. Average value of crude helium increased about $0.003 per cubic foot. Strong demand by government and industry accounted for the increased sales.

Grade-A helium was processed by two companies—Kansas Refined Helium Co. at Otis, Rush County, and Union Carbide Corp., Linde Div., with plants at Bushton, Ellsworth County, Elkhart, Morton County, and Ulysses, Grant County. Union Carbide's Ulysses operation was purchased from Cities Service Cryogenics Inc. on October 1, 1984.

Crude helium was processed by Cities Service Cryogenics Inc. at Scott City, Scott County, Cities Service Helex Co. at Ulysses, Rush County, and Northern Helex Co. at Bushton, Ellsworth County.

Major end uses of helium were cryogenics, pressurizing and purging, and welding.

Lime.—Quicklime was produced by The Great Western Sugar Co. for use in refining sugar at its sugar beet plant near Goodland, Sherman County. Production and value increased 112% and 193%, respectively, mainly because output of sugar at the refinery increased. About 65,000 short tons of quicklime was consumed in the State, along with 16,000 tons of hydrated lime.

Prolonged low sugar prices and other financial difficulties prompted Hunt International Resources Corp. to put the assets of Great Western Sugar and its subsidiaries up for sale at yearend.

Perlite (Expanded).—Lite-Weight Products Inc. expanded crude perlite, mined in the Western States, at its plant in Kansas City, Wyandotte County. Sales increased 25% during 1984. Average value increased about $14 per short ton. Sales were for use as a filter aid and other miscellaneous uses.

Pumice and Pumicite.—Kansas was one of eight States producing pumice, ranking seventh. Production increased about 12%, although average value dropped about $19 per short ton. All production was in Norton County. Major sales were for use as an absorbent, filter aid, and an abrasive.

Calvert Mines Inc., the State's sole producer, was acquired by Bernard Friedman of Allentown, PA, during 1984, and the company name changed to Calvert Corp. The firm continued to operate under the same management.

Salt.—Of the 16 States reporting salt production, Kansas ranked fifth in output. Sales and value increased about 1% and 7%, respectively. Salt was produced by five companies with operations in Ellsworth, Reno, Rice, and Sedgwick Counties. Three companies, American Salt Co., Carey Salt Co., and Independent Salt Co., operated underground mines. Cargill Inc. and Morton Thiokol Inc. evaporated salt from brines. American Salt and Carey Salt also had evaporated brine operations. In addition, a sixth company, Vulcan Materials Co., Chemicals Div., electrolytically separated chlorine, hydrogen, and sodium hydroxide at its brine operations near Wichita, Sedgwick County.

Salt was sold for ice control, the agricultural and meatpacking industries, table salt, and as a hard-water conditioner.

In April, American Salt signed a letter of intent to sell its salt operations near Lyons and another salt mining operation near Salt Lake City, UT, to Diamond Crystal Salt Co. of St. Clair, MI, subject to the board of directors' approval. However, Diamond Crystal's board of directors rejected the proposal in June but declined to elaborate on the subject. American Salt indicated it would seek another buyer.

In another action, American Salt was found liable in U.S. District Court for $3 million in damages and $10 million in punitive damages in a suit involving pollution of an aquifer. The plaintiffs stated that they were unable to irrigate their land and grow corn because of the salt pollution and were forced to grow wheat and milo, less valuable crops. The court's ruling acknowledged that future damages would accrue as each annual crop is damaged, and that plaintiffs would have to file a claim on those damages within 2 years. American Salt was ordered to install a well-moni-

toring system to determine the nature and extent of the pollution as a first step in the cleanup process. The company was required to file progress reports every other month and to present a final report on cleanup alternatives within 8 months.

Sand and Gravel.—*Construction.*—Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only; therefore, this chapter contains only estimates for 1983. Data for odd-numbered years are based on annual company estimates made before yearend.

Nationally, Kansas ranked 24th in the production of sand and gravel for construction purposes. Output decreased nearly 5% compared with 1983 figures, and the value decreased about 1%. Construction sand and gravel was produced by 112 companies and government agencies at 271 pits in 66 of the State's 105 counties. Sedgwick County led the State's production.

Major uses of construction sand and gravel were for concrete aggregate, road base and coverings, asphaltic concrete, and fill.

Table 4.—Kansas: Construction sand and gravel sold or used in 1984, by major use category

Use	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregate	2,680	$6,424	$2.40
Plaster and gunite sands	W	W	2.86
Concrete products	100	330	3.28
Asphaltic concrete	1,139	2,546	2.24
Road base and coverings[1]	2,510	4,534	1.81
Fill	1,106	1,687	1.53
Snow and ice control	122	345	2.83
Railroad ballast	W	W	2.50
Other	4,139	10,492	2.53
Total or average	11,796	26,358	2.23

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Includes road and other stabilization (cement).

Table 5.—Kansas: Construction sand and gravel sold or used by producers, by county

County	1982			1984		
	Number of mines	Quantity (thousand short tons)	Value (thousands)	Number of mines	Quantity (thousand short tons)	Value (thousands)
Barber	7	25	$30	5	9	$11
Barton	2	349	838	2	W	W
Cherokee	3	W	W	2	142	207
Cheyenne	1	13	25	2	W	73
Clark	5	W	22	4	43	71
Cloud	1	122	W	1	W	W
Coffey	--	--	--	2	30	30
Comanche	--	--	--	1	8	8
Cowley	3	163	329	3	290	658
Decatur	2	45	83	3	35	91
Edwards	3	49	87	3	49	109
Ellis	2	61	216	4	246	512
Ellsworth	3	23	36	3	W	W
Finney	2	W	W	6	327	802
Ford	3	W	W	7	346	1,141
Geary	3	W	W	3	174	397
Gove	2	W	50	--	--	--
Graham	1	20	35	--	--	--
Grant	1	W	19	2	52	65
Gray	1	27	33	1	5	7
Greeley	2	W	14	4	5	6
Greenwood	3	60	153	4	73	154
Hamilton	2	55	165	1	18	18
Harper	3	W	W	55	84	96
Harvey	2	W	W	2	261	583
Haskell	1	W	W	3	196	326
Hodgeman	2	24	28	1	3	4
Jackson	1	W	21	7	31	46

See footnotes at end of table.

Table 5.—Kansas: Construction sand and gravel sold or used by producers, by county —Continued

County	1982			1984		
	Number of mines	Quantity (thousand short tons)	Value (thousands)	Number of mines	Quantity (thousand short tons)	Value (thousands)
Kearny	4	98	$346	8	241	$1,260
Kingman	2	20	36	--	--	--
Kiowa	2	153	274	2	65	75
Lincoln	20	61	73	1	10	W
Logan	1	13	13	2	17	46
Lyon	2	49	49	6	9	9
McPherson	1	6	6	--	--	--
Marshall	2	W	W	3	105	311
Meade	1	27	40	2	53	91
Morton	1	2	4	2	22	46
Neosho	1	85	248	--	--	--
Ness	6	94	94	6	142	142
Norton	6	36	34	5	60	60
Ottawa	2	94	112	1	16	64
Pawnee	2	58	142	4	78	232
Phillips	2	18	35	2	10	26
Pottawatomie	2	52	104	2	55	104
Pratt	2	W	W	3	399	1,468
Rawlins	2	10	20	--	--	--
Reno	5	512	1,006	4	476	1,027
Rooks	2	10	19	1	12	31
Russell	5	37	47	4	56	89
Sedgwick	13	2,189	3,765	16	2,336	4,794
Seward	5	108	314	5	124	316
Shawnee	7	411	798	7	879	1,947
Sheridan	8	51	51	8	77	77
Sherman	12	W	W	2	34	88
Stevens	2	46	46	1	42	42
Sumner	1	W	W	1	99	173
Thomas	4	74	144	1	16	37
Trego	11	72	105	10	113	200
Wallace	1	2	4	--	--	--
Washington	1	W	W	4	134	218
Wichita	1	W	20	1	22	24
Wyandotte	8	W	W	4	999	1,939
Undistributed[1]	21	4,355	10,479	21	2,672	6,005
Total[2]	229	9,720	20,612	271	11,796	26,358

W Withheld to avoid disclosing company proprietary data; included with "Undistributed."
[1]Includes Clay, Dickinson, Douglas, Johnson, Republic, Rice, Riley, Saline, Stafford, and Wilson Counties and data indicated by symbol W.
[2]Data may not add to totals shown because of independent rounding.

Industrial.—Nationally, Kansas ranked 26th of 38 States in industrial sand production. Production and value dropped 29% and 28%, respectively, in 1984. Industrial sand was produced in Republic and Wyandotte Counties by three companies. Wyandotte County, with two operations, led the State's production. Sales were made for sandblasting and other uses.

Stone.—Stone is surveyed by the U.S. Bureau of Mines for odd-numbered years only; therefore, this chapter contains only estimates for 1984. Data for even-numbered years are based on annual company estimates made before yearend.

Crushed.—Crushed stone production and value were estimated to have increased about 7% in 1984. Historically, Kansas' crushed stone has been used for agricultural limestone, cement and lime manufacture, concrete and bituminous aggregate, filler stone, railroad ballast, and other miscellaneous uses.

In June, Midwest Minerals Inc., headquartered in Pittsburg, Crawford County, purchased the quarrying assets of O'Brien Rock Co. of St. Paul, Neosho County. The purchase included all crushing equipment, quarries at Chetopa, Labette County, Urbana, Neosho County, and South Mound, Neosho County, and real estate near South Mound. The acquisition was expected to improve the supply and efficiency of Midwest Minerals' southeastern Kansas operations that supply agricultural lime and crushed stone. Midwest Minerals also has operations in neighboring areas of Missouri and Oklahoma.

Quartzite Stone Co. Inc., at Lincoln, Lincoln County, was acquired by J. H. Shears & Sons, a sand and gravel producer, of Hutchinson, Reno County. The acquisi-

tion expanded Shears' market area and product lines. Both companies produced aggregate used in concrete and road construction. Quartzite Stone began to install a new $2 million crushing plant that was expected to be completed during 1985.

The National Limestone Institute awarded Bayer Construction Co. Inc. a special safety certificate for 5 years of operation without a disabling injury at its Martin Quarry in Clay County.

Dimension.—Production and value of dimension stone were estimated to have dropped 19% and 15%, respectively, during 1984.

Sulfur (Recovered).—Sulfur was recovered as a byproduct of the petroleum refining operations of Texaco Refining & Marketing Co. at El Dorado in Butler County and Farmland Industries Inc. at Coffeyville in Montgomery County. Sales increased 19% during 1984, but the average value per metric ton dropped $6.39.

Texaco acquired the El Dorado operation in February when it purchased Getty Refining & Marketing Co.

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[1]State Mineral Officer, Bureau of Mines, Minneapolis, MN.

[2]Associate scientist, Mineral Information, Kansas Geological Survey, Lawrence, KS.

[3]Editorial assistant, Bureau of Mines, Minneapolis, MN.

Table 6.—Principal producers

Commodity and company	Address	Type of activity	County
Cement:			
Ash Grove Cement Co.[1 2]	Box 25900 Overland Park, KS 66225	Plant and quarry	Neosho.
General Portland Inc., Victor Div., LaFarge Corp.[1 2]	7701 East Kellogg St. Suite 240 Wichita, KS 67207	do	Wilson.
Lehigh Portland Cement Co., Heidelberger Zement AG[1 2]	718 Hamilton Mall Allentown, PA 18105	do	Montgomery.
Lone Star Industries Inc.[2]	Box 12449 Dallas, TX 75225	do	Wyandotte.
The Monarch Cement Co.[1 2]	Box 187 Humboldt, KS 66748	do	Allen.
Clays:			
Buildex Inc., a division of Clemens Coal Co.	Box 62299 Pittsburg, KS 66762	Pits and plants	Franklin and McPherson.
Cloud Ceramics, a division of General Finance Inc.	Box 369 Concordia, KS 66901	Pits and plant	Cloud.
W. S. Dickey Clay Manufacturing Co	Box 6 Pittsburg, KS 66762	Pit and plant	Cherokee.
Ideal Basic Industries Inc	Box 8789 Denver, CO 80201	Pit	Jewell.
Justin Industries Inc., Acme Brick Co	Box 98 Kanopolis, KS 67454	Pits and plants	Cherokee and Ellsworth.
Kansas Brick & Tile Co. Inc	Box 540 Hoisington, KS 67544	Pit and plant	Barton.
Micro-Lite Inc	1100 South Katy St. Chanute, KS 66720	do	Woodson.
Gypsum:			
Georgia-Pacific Corp	133 Peachtree St., NE. Atlanta, GA 30303	Underground mine and plant.	Marshall.
National Gypsum Co	2001 Rexford Rd. Charlotte, NC 28211	Open pit, underground mine, plant.	Barber.
Helium:			
Cities Service Helex Co.	Route 1, Box 14D Satanta, KS 67870	Plants	Rush and Scott.
Kansas Refined Helium Co	Otis, KS 67565	Plant	Rush.
Northern Helex Co	Bushton, KS 67427	do	Ellsworth.
Union Carbide Corp., Linde Div.	do	Plants	Ellsworth, Grant, Morton.
Lime:			
The Great Western Sugar Co	Box 5308 Denver, CO 80217	Plant	Sherman.
Perlite (expanded):			
Lite-Weight Products Inc	1706 Kansas Ave. Kansas City, KS 66105	do	Wyandotte.
Pumice and pumicite:			
Calvert Corp	Box 97 Norton, KS 67654	Pit and plant	Norton.
Salt:			
American Salt Co	3142 Broadway Kansas City, MO 64111	Wells and underground mine.	Rice.
Carey Salt Co., a division of Processed Minerals Inc.	1800 Carey Blvd. Hutchinson, KS 67501	Underground mine	Reno.
Cargill Inc., Salt Div	Box 1403 Hutchinson, KS 67501	Wells	Do.

See footnotes at end of table.

Table 6.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Salt —Continued			
Independent Salt Co	Box 36 Kanopolis, KS 67454	Underground mine	Ellsworth.
Morton Salt Co., a division of Morton Thiokol Inc.	110 North Wacker Dr. Chicago, IL 60606	Wells	Reno.
Vulcan Materials Co., Chemicals Div	Box 7689 Birmingham, AL 35223	do	Sedgwick.
Sand and gravel:			
Construction:			
Builders Sand Co	4150 Kansas Ave. Kansas City, KS 66106	Dredges and plants	Johnson and Wyandotte.
Holliday Sand & Gravel Co., a division of List & Clark Construction Co.	6811 West 63d St. Overland Park, KS 66202	Pits and plants	Do.
Miles Sand Inc	4852 North Meridian Wichita, KS 67204	Pit and plant	Sedgwick.
Ritchie Paving Inc	6500 West 21st St. Wichita, KS 67204	Dredge and plant	Do.
Industrial:			
Holliday Sand & Gravel Co, a division of List & Clark Construction Co.	6811 West 63d St. Overland Park, KS 66202	Pit and plant	Wyandotte.
HUB Materials Inc	Box 11126 Kansas City, KS 66111	do	Do.
Stone (1983):			
Crushed:			
Limestone:			
Ash Grove Cement Co	Box 25900 Overland Park, KS 66225	Quarries, underground mine, plants.	Johnson and Neosho.
N. R. Hamm Quarry Inc	Box 17 Perry, KS 66073	Quarries and plants	Various (8 counties).
McAdam Limestone Products Inc.	Moran, KS 66755	do	Anderson, Bourbon, Cowley, Linn.
Martin Marietta Aggregates, Central Div.	Box 30013 Raleigh, NC 27622	do	Various (8 counties).
Midwest Minerals Inc	Box 412 Pittsburg, KS 66762	do	Cherokee, Crawford, Labette, Montgomery, Neosho, Wilson.
Thompson-Strauss Quarries Inc., a division of Beatrice Foods Co.	7000 Holliday Dr. Kansas City, KS 66106	Underground mine and plant.	Wyandotte.
Whitfield Sand & Concrete Inc	Route 4 Pratt, KS 67124	Pits and plants	Pratt.
Sandstone:			
Quartzite Stone Co. Inc	Box 97 Lincoln, KS 67455	Quarries and plant	Lincoln.
Dimension:			
Limestone:			
Bayer Stone Inc	6th and Mission St. Marys, KS 66536	Quarries	Pottawatomie and Riley.
H. J. Born Stone Inc	Box 45 Silverdale, KS 67005	do	Chase and Cowley.
Sulfur (recovered):			
Farmland Industries Inc	North Linden St. Coffeyville, KS 67337	Secondary recovery plant.	Montgomery.
Texaco Refining & Marketing Co	Box 1121 El Dorado, KS 67042	do	Butler.

[1]Also clays.
[2]Also crushed stone.

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